MECHANICAL SAFETY DEVICE FOR A DOOR PIVOTALLY MOUNTED ON A FRAME

BACKGROUND OF THE INVENTION

The invention relates to a mechanical safety device for a door pivotally mounted in a frame between an open position and a closed position, the device being equipped with protection means to prevent fingers from getting jammed when the door is closed, by preventing access to the vertical gap arranged on the side where the hinges are located between the frame and the rear edge of the door by means of a strip made of flexible or semi-rigid material fixed to the frame and cooperating in the intermediate part with a guiding part to arrange a pre-determined clearance with respect lo the door, authorizing a relative sliding movement of the free end of the strip when angular variation of the gap takes place, the guiding pant being fixed to the door by assembly elements.

STATE OF THE TECHNIQUE

Risks of fingers getting jammed between the door and the support frame can occur on the side where the closing handle is situated, and on the side where the hinges are located as a result of deliberate or involuntary slamming of the door without the handle being used.

For protection on the side where the hinges are located, it is state of the art to make use of a flap folded into a concertina, or a flexible gusset which is deformed according to the angle of pivoting of the door to prevent access to the gap. Such devices are described in the documents FR-A-2620484, 2565622, and 2646460, and present a large swelling in the open position of the door. Such a swelling is unaesthetic and moreover increases the force required to move the door when deformation of the flap or gusset takes place.

The document DE 3607178 describes a door protection by means of a flexible strip cooperating with a guiding slot. The of angular deformation of the strip in the zone to be protected nevertheless remains large.

In the document DE 3716654, protection is performed by a spring in the form of a rolling flap fixed to the top and to the bottom pan of the door.

OBJECT OF THE INVENTION

The object of the invention is to achieve a reliable safety device, able to be easily fitted to all types of hinged doors, not presenting any protruding part regardless of the angle of pivoting of the door, and enabling total protection to be achieved along the height of the door, and on both the apparent (i.e., where the hinges are visible when the door is closed) and non-apparent (i.e., where the hinges are not visible when the door is closed) sides of the hinges.

The device according to the invention is characterized in that:

- a fixing part for fixing a strip onto a frame comprises means for rounding the strip over the whole height thereof so as to perform preliminary bending of the curved surface at a predetermined angle,
- a guiding part comprises a plate made of rigid plastic material whose vertical edge located opposite the hinges is secured to the door by assembly elements, constituting the closed bottom of a guiding slot for housing the sliding part of the strip,
- the strip and the plate extend right down to the bottom of the door to achieve total protection.

According to one feature of the invention, the strip is made of plastic material of small thickness having a variable curved surface in the zone to be protected and remaining appreciably parallel to the door beyond the guiding part.

The coaxial arrangement of the tubular element with the hinges and the sliding movement of the flexible strip prevent any swelling effect when the door is opened. The tubular element has a diameter close to that of each hinge and is provided with a flat fixing tab, the assembly thus formed having the form of a profiled part made of rigid or flexible plastic material able to be assembled either to the frame or to the door.

BRIEF DESCRIPTION OF THE DRAWINGS

Other advantages and features will become more clearly apparent from the following description of an embodiment of the invention given as a non-restrictive example only and represented in the accompanying drawings in which:

FIGS. **1** and **2** are schematic views of a hinged door equipped with a safety device, represented on the apparent side of the hinges, and on the non-apparent side of the hinges, respectively;

FIG. **3** is a schematic view on an enlarged scale of the safety device of FIG. **1** arranged on the apparent side of the hinges;

FIG. **4** shows a cross-sectional view along the line **4**—**4** of FIG. **3** when the door is open;

FIG. **5** is a schematic view on an enlarged scale of the safety device of FIG. **1** arranged on the non-apparent side of the hinges;

FIG. **6** represents a cross-sectional view along the line **6**—**6** of FIG. **5** when the door is open;

FIG. **7** is an identical view to FIG. **6** when the door is closed;

FIG. **8** is a detailed view of FIG. **7**.

DESCRIPTION OF A PREFERRED EMBODIMENT

With reference to the figures, a door **10** with hinges **42**, **44** comprises an actuating handle **12** and a protection unit **40** to prevent fingers from getting jammed when the door **10** is closed, by preventing access to the vertical gap **45** arranged on the side where the hinges **42**, **44** are located between the frame **14** and the rear edge **48** of the door **10**.

FIGS. **3** and **4** show the protection device **40** for the apparent side of the door. As shown in FIGS. **3** and **4**, the protection unit **40** comprise tubular elements **46** in the form of elongated profiled parts on the apparent side of the hinges **42**, **44** (FIGS. **1**, **3** and **4**). These tubular elements **46** are fitted in vertical alignment with the hinges **42**, **44** in such a way as to permanently fill the vertical gap **45** that appears between the frame **14** and the rear edge **48** of the door **10** when pivoting of the door takes place. Each tubular element **46** presents a diameter close to that of the hinges **42**, **44**, and is provided with a flat fixing tab **50** able to be assembled either to the frame **14** or to the door **10**. The tubular elements **48** are fitted between the hinges **42**, **44** along the height of the door **10** and are advantageously made of rigid or flexible plastic material. Fitting of the fixing tab **50** can be performed by any assembly means, currently available or later developed.

FIGS. **5** to **8** show the protection device **52** for the non-apparent side of the door. In FIGS. **5** to **8**, another protection device **52** is provided opposite the tubular elements **46**, being arranged on the non-apparent side of the